

We Claim:

1. A bus air conditioning system with at least one air conditioning module installed on a bus roof having a pair of supply air openings for conducting the flow of conditioned air downwardly near the outer side of the roof and a return air opening whose position may vary substantially in the lateral direction from a longitudinal central axis of the bus for any given installation, comprising:

a refrigeration circuit for circulating refrigerant serially through a compressor, a condenser coil, an expansion valve and an evaporator coil;

an evaporator section including an evaporator blower for causing return air to flow from said return air opening, into a return air compartment of said evaporator section, through said evaporator coil and then to said supply air opening; and

a condenser fan for causing outside air to flow over said condenser coil and then to be discharged outside;

wherein said compressor is a horizontal compressor having a longitudinal axis, the compressor mounted proximate to the roof of the bus and external to the passenger compartment of the bus, the compressor oriented such that the longitudinal axis of the compressor is substantially transverse to the longitudinal axis of the bus.

2. The bus air conditioning system of claim 1 wherein the compressor is a rotary compressor.

3. The bus air conditioner of claim 1 wherein the compressor is a rotary vaned compressor

4. The bus air conditioner of claim 1 wherein the compressor is a scroll compressor.

5. The bus air conditioning system of claim 1 wherein the compressor is configured to maintain operational lubrication when the longitudinal axis of the bus is inclined from a horizontal position.
6. The bus air conditioning system of claim 1 wherein the compressor is configured to maintain operational lubrication when the longitudinal axis of the bus is inclined more than 10 degrees from a horizontal position.
7. The bus air conditioning system of claim 1 wherein the compressor is configured to maintain operational lubrication when the longitudinal axis of the bus is inclined about 20 degrees from a horizontal position.
8. The bus air conditioning system of claim 1 wherein the refrigeration circuit extends less than about 200mm above the roofline of the bus.
9. The bus air conditioning system of claim 8, wherein the compressor includes a scroll compressor.
10. The bus air conditioning system of claim 8, wherein the compressor includes a rotary compressor
11. The bus air conditioning system of claim 8, wherein the compressor includes a rotary vane compressor.
12. The bus air conditioning system of claim 1 wherein the compressor is configured to maintain operational lubrication when the bus is subject to a rolling motion about its longitudinal axis.
13. The bus air conditioning system of claim 12 wherein the rolling motion of the bus is less than about +/- 10 degrees.